A STUDY ON THE KNOWLEDGE, ATTITUDE AND ADOPTION OF SUSTAINABLE RICE CULTIVATION PRACTICES IN BIRBHUM DISTRICT OF WEST BENGAL

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INTRODUCTION

Paddy (*Oryza sativa*) is one of the important cereal crops of the world and forms the staple food for more than 50 per cent of population and is known as "king of cereals". The United Nations General Assembly, in a resolution declared the year of 2004 as the "International Year of Rice", which has tremendous significance to food security. It very eloquently upheld the need to heighten awareness about the role of rice in alleviating poverty and malnutrition (Bharath and Pandey, 2005). Rice is an important food crop of India and stands first in area and second in total food production. Rice is an important food crop of India and stands first in area and second in total food production. Among the rice growing countries, India has the largest area under rice in the world (45.50 million ha) with a total production of 96.43 million tonnes during 2007-08 and it stood next only to China in the world with respect to production. But, the yield levels in India are low at 2.20 tonnes per ha compared to other major rice producing countries *viz.*, Japan (6.52 t/ha), China (6.24 t/ha) and Indonesia (4.25 t/ha). About 67 per cent of the area under paddy in India is under high yielding varieties. In India, the highest area under paddy is in Uttar Pradesh (59.20 lakh ha), followed by West Bengal (56.90 lakh ha), Yield of rice in West Bengal is 5783.6 tonnes. There is an urgent need to develop farming techniques, which are sustainable from environmental, production and socio-economic point of view. That means to guarantee sufficient food production in the next decades and beyond is critical because modern agriculture production throughout the world does not appear to be sustainable in the longterm. The agricultural community is thus setting it hopes on sustainable agriculture, which will maintain the cycle of input- output and ecosystem balance.

Definition of FAO (1991), seems appropriate in this context "Sustainable rural development is the management and conservation of natural resource base and the orientation of technological and institutional change in such a manner as to assure the attainment and continued satisfaction of human needs for the present and future generations.

The success in promoting sustainable agriculture can be achieved through genetic diversity, crop diversification, integrated nutrient management, integrated pest management and sustainable water management (Muthuraman, 1995). Rice is one such crop where there is lot of scope to incorporate the above said practices, systematically to harvest higher yields and to maintain soil productivity. Hence, in order to minimize the cost of production and maximize the productivity without affecting the environment, certain steps need to be taken for rice cultivation, viz, integrated nutrient management, integrated pest management and water management.

From the foregoing discussion, it is evident that rice command greater importance for attaining a better position in the world market, which would inturn contribute to our national income. At the same time, there is a need to concentrate on certain specific sustainable cultivation practices which are eco-friendly and cost effective. Since, the issues of higher cost of cultivation due to increased use of pesticides and fertilizers and other environmental issues are gaining paramount importance, greater emphasis is thus being laid on sustainable cultivation practices in the recent past.

Objectives of study:

1. To find out the socio-economic and psychological variables of rice growers.
2. To study the knowledge level of rice growers about sustainable cultivation methods.
3. To study the attitude of rice growers towards sustainable cultivation practices.
4. To find out the extent of adoption of sustainable cultivation practices by the rice growers.
5. To measure the technological gap of rice growers in adoption of sustainable cultivation practices.
6. To elicit the constraints in adoption of sustainable cultivation practices as perceived by rice growers.
7. To suggest some measures for the sustainability of the rice cultivation practices.

Review of literature

Jaiswal and Sharma (1990) conducted a study on constraints in adoption of improved technology of rice and reported that with regard to adoption of fertilizer, 72 per cent of the farmers were using nitrogen, 49 per cent used phosphorus and only 18 per cent used potash, although the farmers were convinced regarding balanced use of fertilizers.

Gopikrishna (1993) while studying the yield gap and adoption of improved practices of paddy under different irrigation systems observed that 80 per cent of the respondents had adopted improved varieties under canal irrigation system in contrast to cent per cent of farmers adopting improved varieties under tank and well irrigation systems.

Paroda (1995) defined sustainable agriculture as the appropriate use of crop livestock systems and the agricultural inputs supporting their activities which maintain economic and social viability while preserving the high productivity and quality of land.

Chothe and Borkar (2000) while studying constraints faced by farmers in adoption of bio-fertilizers in Maharashtra state revealed that 63.00 per cent of farmers had medium adoption of bio fertilizers, followed by 42.00 and 39.00 per cent of them were having high and low adoption of bio fertilizers, respectively.

Hegde (2000) said that sustainable agriculture is a set of farming practices which can continue to maintain the farm productivity, efficiency and productivity in the long run, without depleting the natural resources and environment.

Roy *et al.* (2014) revealed that less than half of the rice growers were sustainable in terms of economical viability, ecological benefits, and quality of life.

Singha and Mishra (2015) found that out of total 152 samples, 30 rice farming households have been categorised as sustainable, 97 as moderate and 25 as vulnerable.

Ashoori *et al.* (2016) revealed that paddy growing farmers in Northern Iran had a positive attitude towards the protection of water and soil in the region.

Haque *et al.* (2016) found that majority of the farmers were in medium to high categories in use of IPM practices though about one sixth of the farmers were in low practice group of IPM in rice.

Hoque *et al.* (2016) reported that cent percent of the respondent could correctly mention the name of high yielding variety of rice along with majority correct responses on 'characteristics of good quality seed' (88.0%), 'important diseases of rice' (50.7%), 'seed rate' (74.6%), 'suitable soil type' (76.6%), 'appropriate moisture content of rice during storage' (72.7%), 'balanced dozes of NPK for rice production' (62.9%) and 'harmful insect for rice cultivation' (88.3%).

Research methodology

Research design: The study will follow ex-post facto research design.

Locale of the study: The study will be conducted in Birbhum district of West Bengal.

Sample size: 250 rice growing farmers

Variables and their measurement

Sl. No.	**Variables**	**Measurement tools**
A.	**Dependent variables**	
1.	Knowledge level	Teacher made knowledge test on sustainable cultivation practices in rice will be developed
2.	Extent of adoption	Sustainable technology adoption index by Lakshminarayan (1997).
3.	Technological gap	Procedure followed by Bheemappa (2001).
B.	**Independent variables**	
I.	**Situational attributes**	
4.	Age	Procedure followed by Rathod (2005).
5.	Education	Procedure followed by Satyavati (2001).
6.	Land holding	Procedure followed by Satyavati (2001).
7.	Farming experience	Procedure followed by Lakshminarayana (1997).
II.	**Psychological attributes**	
8.	Risk orientation	Scale developed by Nagaraj (1989).
9.	Scientific orientation	Scale developed by Supe (1969) and modified by Nagaraj (1989).

10.	Attitude towards sustainable cultivation practices	Scale developed by Chandregowda (1996).
11.	Management orientation	Scale developed by Samantha (1977).
12.	Achievement motivation	Procedure followed by Reddy (1976).
13.	Innovative proneness	Procedure followed by Moulik (1965).
III.	**Communication attributes**	
14.	Extension contact	Procedure followed by Bheemappa (2001).
15.	Social participation	Procedure followed by Bheemappa (2001).
16.	Mass media participation	Procedure followed by Patil (1990).
IV.	**Socio-economic status**	
17.	Cropping intensity	Procedure followed by Sinha and Kolte (1974)
18.	Annual income	Yearly income of farmer in rupees.
19.	Land productivity	Formula developed by Chandregowda (1996).

Method of data collection

A structured pre- tested interview schedule will be constructed and required data will be collected from the sample farmers by interview method.

Statistical tools

The statistical tools like frequency, percentage, mean, standard deviation, correlation and regression will be used wherever found appropriate and data would be analysed systematically to draw the meaningful conclusions and valid inference.

Expected outcome

The study would be of great help to evaluate the knowledge level of farmers about the different sustainable rice cultivating practices. In the process, the reasons for low sustainability could be analyzed and necessary corrective measures can be suggested to overcome those lacunae.

The study also aims to delineate the differential characteristics between farmers who are practicing sustainable rice growing practices and who are not practicing. This would give ample opportunity for the extension workers to manipulate and promote those factors while educating rice cultivating farmers.

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